CLAIMS

What is claimed is:

1. An apparatus for automatically adjusting tilting between an optical pickup unit of an optical disc drive, sliding along a pair of rails supported by three adjusting parts and one fixed part, and a turntable on which an optical disc is placed, the apparatus comprising:

a base;

placing parts connected to the base, on which the optical disc drive is placed;

a plurality of height measurers that measure heights of two portions of each of the pair of rails relative to the base;

adjusters that adjust the adjusting parts;

a mirror disc mounted on the turntable and spins;

two mirror plates installed on the pair of rails;

an autocollimator that radiates parallel light beams onto the mirror disc and the two mirror plates;

a photo detector that detects focused points of the light beams reflected from the mirror disc and the two mirror plates and passing through the autocollimator; and

a controller that calculates an amount of tilting from a distance between the focused points.

2. The apparatus of claim 1, wherein the two mirror plates are spaced apart from each other in a first direction that is approximately perpendicular to the pair of rails.

3. The apparatus of claim 2, wherein the two mirror plates comprise:

a first mirror plate that has

a first reflective surface, and

first supports supported on the pair of rails; and

a second mirror plate that is installed over the first mirror plate and has

a second reflective surface,

second supports supported on the pair of rails, and

a connection hole through which the light beams are transmitted to the first reflective surface.

4. The apparatus of claim 2, wherein the two mirror plates comprise:

a first mirror plate that has

a first reflective surface, and

first supports supported on two portions of one of the pair of rails and on a portion of the other of the pair of rails; and

a second mirror plate that is installed over the first mirror plate and has

a second reflective surface,

second supports supported on a portion of the one of the pair of rails and on two portions of the other of the pair of rails, and

a connection hole through which the light beams are transmitted to the first reflective surface.

5. The apparatus of claim 1, wherein:

the controller determines a central point between the focused points of light beams reflected from the two mirror plates as a first focused point;

the controller determines a central point of an approximately circular area of the focused point of light reflected from the mirror disc as a second focused point; and

the controller calculates the amount of tilting from a distance between the first and second focused points.

6. The apparatus of claim 5, wherein:

the controller places three points on a perimeter of the approximately circular area and determines a central point of the three points as the second focused point.

7. The apparatus of claim 1, further comprising:

a monitor that displays the focused points detected by the photo detector.

8. The apparatus of claim 1, wherein:

the height measurers are installed adjacent to the fixed part and the adjusting parts.

9. A method of automatically adjusting tilting of an optical disc drive in which tilting is measured between an optical pickup unit sliding along a pair of rails supported by three adjusting parts and one fixed part, and a turntable on which the optical disc drive is placed, the method comprising:

adjusting the pair of rails to be parallel;

radiating a plurality of parallel light beams, using an autocollimator, onto

a mirror disc that is mounted on the turntable and spins, and

two mirror plates that are installed on the pair of rails;

calculating an amount of tilting from focused points of light beams reflected from the mirror disc and the mirror plates and passing through the autocollimator; and

adjusting the adjusting parts according to the amount of tilting.

10. The method of claim 9, further comprising calculating an amount of tilting from focused points of light beams reflected from the mirror disc and two mirror plates again after adjusting the adjusting parts, to check whether the amount of tilting is within a predetermined permitted limit.

11. The method of claim 10, wherein if the amount of tilting is not within the predetermined permitted limit, the adjusting the adjusting parts is performed again.

12. The method of claim 11, wherein if the number of times the adjusting the adjusting parts is performed equals a predetermined maximum number of times tilting is adjusted, adjusting tilting stops.

13. The method of claim 9, wherein the adjusting the pair of rails to be parallel comprises:

placing the optical disc drive on placing parts;

measuring heights of at least two portions of each of the pair of rails; and

adjusting the adjusting parts so that heights of the pair of rails are the same.

14. The method of claim 9, wherein the calculating the amount of tilting from focused points of light beams reflected from the mirror disc and the mirror plates and passing through the autocollimator comprises:

detecting a first focused point formed by reflection from the two mirror plates and a second focused point formed by reflection from the mirror disc; and

calculating the amount of tilting from a distance between the first focused point and the second focused point.

15. The method of claim 14, wherein the calculating the amount of tilting from focused points of light beams reflected from the mirror disc and the mirror plates and passing through the autocollimator further comprises:

stopping adjusting tilting if the first and second focused points are not detected.

16. The method of claim 14, wherein the detecting the first focused point formed by reflection from the two mirror plates comprises:

determining a central point on a line connecting two focused points formed by reflection from the first and second mirror plates.

17. The method of claim 14, wherein the detecting the second focused point formed by reflection from the mirror disc comprises:

determining a central point of an approximately circular area formed by reflection from the mirror disc.

18. The method of claim 9, wherein the adjusting the adjusting parts according to the amount of tilting comprises:

calculating amounts of necessary adjustment of the adjusting parts from the amount of tilting;

adjusting the three adjusting parts to adjust tilting in the radial direction; and

adjusting two of the three adjusting parts of one of the pair of rails that is supported by the two adjusting parts, to adjust tilting in a tangential direction.

19. An apparatus for adjusting tilting of an optical disc in which tilting is measured between an optical pickup unit that slides along a pair of rails that are supported by three adjusting parts and one fixed part, and a turntable on which an optical disc is placed, the apparatus comprising:

a base with placing parts, on which the optical disk is placed;

at least one height measurer that measures the heights of at least two portions of each of the pair of rails relative to the base;

at least one adjuster that adjusts the adjusting parts;

a mirror disc that is mounted on the turntable

a plurality of mirror plates that are installed on the pair of rails;

an autocollimator that radiates parallel light beams onto the mirror disc and the plurality of mirror plates;

a photo detector that detects focused points of the light beams reflected from the mirror disc and the plurality of mirror plates; and

a controller that determines an amount of tilting from a distance between the focused points.

20. A method of measuring tilting of a turntable of an optical disc drive relative to a pair of guide rails of the optical disc drive, comprising:

radiating a plurality of parallel light beams, using an autocollimator, onto

a mirror disc mounted on the turntable, and

two mirror plates that are installed on the pair of rails;

calculating an amount of tilting from focused points of light beams reflected from the mirror disc and the mirror plates and passing through the autocollimator.

21. The method of claim 20, wherein the radiating a plurality of parallel light beams, using an autocollimator, onto a mirror disc mounted on the turntable comprises:

spinning the mirror disc mounted on the turntable.

22. The method of claim 20, wherein the calculating the amount of tilting from focused points of light beams reflected from the mirror disc and the mirror plates and passing through the autocollimator comprises:

detecting a first focused point formed by reflection from the two mirror plates;

detecting a second focused point formed by reflection from the mirror disc; and

calculating the amount of tilting from a distance between the first focused point and the second focused point.

23. The method of claim 22, wherein:

the first focused point is a central point on a line connecting two focused points formed by reflection from the first and second mirror plates.

24. The method of claim 22, wherein:

the second focused point is a central point of an approximately circular area formed by reflection from the mirror disc.